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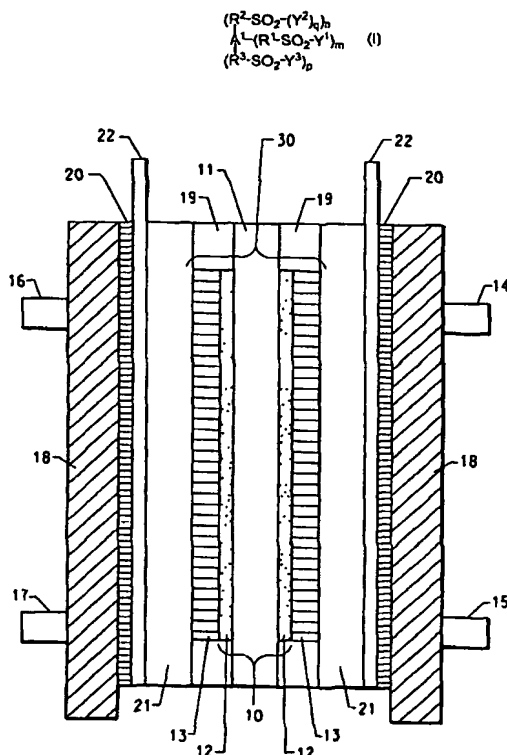
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(54) Title: **SULFONIMIDE CONTAINING COMPOUNDS AND THEIR USE IN POLYMER ELECTROLYTE MEMBRANES FOR ELECTROCHEMICAL CELLS**



(57) Abstract: A compound having the general structure (I), wherein A<sup>1</sup> is a monovalent, divalent, or trivalent aromatic heterocyclic group comprising heterocyclic rings; R<sup>1</sup>, R<sup>2</sup>, and R<sup>3</sup> are divalent fluorinated groups; m, n, and p are 0 to 3, with the proviso that m + n + p is equal to 1, 2, or 3 so that the carbon atoms of the heterocyclic rings are fully substituted by acidic fluorinated sulfonyl-containing groups; q is 0 or 1; Y<sup>1</sup> is -OH, -NH-SO<sub>2</sub>-R<sup>4</sup> wherein R<sup>4</sup> is a monovalent fluorinated group, -NH-, -NH-SO<sub>2</sub>-R<sup>5</sup>-SO<sub>2</sub>-NH-, or -NH-SO<sub>2</sub>-R<sup>6</sup>-A<sup>2</sup>-R<sup>7</sup>-SO<sub>2</sub>-NH-, wherein A<sup>2</sup> is a divalent heterocyclic group and R<sup>5</sup>, R<sup>6</sup>, and R<sup>7</sup> are divalent fluorinated groups; and Y<sup>2</sup> and Y<sup>3</sup> are -OH or -NH-SO<sub>2</sub>-R<sup>4</sup>; with the proviso that when m and n are each equal to 1, p is 0 to 1, and q is 0, Y<sup>1</sup> is selected from the group consisting of -NH-, -NH-SO<sub>2</sub>-R<sup>5</sup>-SO<sub>2</sub>-NH-, and -NH-SO<sub>2</sub>-R<sup>6</sup>-A<sup>2</sup>-R<sup>7</sup>-SO<sub>2</sub>-NH-. By compound is meant either a small molecule or a repeat unit of a polymer. The invention also provides a solid polymer electrolyte membrane, a membrane electrode assembly, a gas diffusion electrode, an electrocatalyst coating composition, and a fuel cell.



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